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habits of the moose and the other large mammals of this region; and some years since (in 1860) he published an interesting series of articles in the now defunct "Bethel Courier," on the "Wild Animals of Maine," in which he brought together facts of great value to the naturalist, including the most complete history of the moose yet extant. It is to be hoped that he will be able to soon reissue these valuable sketches in a more permanent form.

NOTES ON CERTAIN INLAND BIRDS OF NEW JERSEY.

BY CHARLES C. ABBOTT, M.D.

THE ornithological fauna of New Jersey having undergone some changes within the last few years, it may prove interesting to ornithologists to have the results of ten years constant, careful observation as to the movements of our inland birds; comprising those that are resident; those coming from the South in the spring, and visitors from the North in winter. Certain species formerly abundant are now rare; and others formerly but seldom met with, are now abundant. As an instance we will mention the Summer Red-bird (*Pyrranga aestiva*), which may no longer be accounted a summer resident, although prior to 1857 it was abundant; and on the other hand the Snow-bunting (*Plectrophanes nivalis*), which previous to 1865, was a very rare visitor, and then only during very severe winters, and since has as regularly appeared as the *Junco hyemalis*. They do not appear, like them, early in October, but after considerable snow has fallen. During the winters of '67, '68 and '69, they were so abundant that hundreds of dozens killed on the outskirts of the town (Trenton, Mercer Co.), were offered for sale in our markets. Every additional snow storm seemed to in-

crease their numbers. They were very fat, and, considered as delicate as the Rice bird, *Dolichonyx orizivorus*, in October.

It may be proper here to state that the climate, during the past thirty-eight years, has undergone no change other than a slight diminution in the quantity of snow.

The species to which I desire to call particular attention are

1. Pigeon Hawk (*Hypotriorchis columbarius*). During the early autumn, when the Reed-birds (*Dolichonices*), have gathered in the marshy meadows, and the Red-winged Starlings (*Agelaii*), fairly blacken the drier lowlands; when the "Flicker" (*Colaptes*), is rattling off the thin bark from the hickories, and congregated Blue-birds twitter from every panel of fence; when the unsought Meadow-lark (*Sturnella*) challenges you to discover his retreat, with his saucy "you-can't see-me," and timid snipe (*Gallinago*), with a nervous "escape" endeavor to avoid the gunner's aim with a most eccentric flight,—then really are the days proper of our birds of prey, and all of our species, from the magnificent Black-hawk (*Archibuteo Sancti-Johannis*), to the saucy Sparrowhawk (*Tinnunculus sparverius*), are more or less abundant. Ever on the alert for wounded birds or rash Meadow-mice, they sail over the meadows from morning till night and add no little charm to the attractive scene; but while all this is the order of the day upon the lowlands, there is skulking along the fences of the uplands, and about the yards of the farm-houses, a shy, cunning falcon, ever watching the farmer's poultry and pouncing thereupon continually. We refer to the Pigeon-hawk (*Hypotriorchis columbarius*), a species numerous throughout autumn and winter, but especially interesting from the fact that it remains throughout the year quite frequently.

In May, 1863, a nest of this species, with young birds just able to fly, was found by the writer in a large sycamore, on Duck Island, Delaware River, near Trenton, N. J. In

February (22d) 1865, a nest with eggs was also found by the writer, in a large elm, on the Shabbaconk Creek, near Lawrence, Mercer county, New Jersey. Young specimens in pin-feathers have been killed, in August and November, by a cousin of the author, which were seen and identified by the latter.

New Jersey seems to be a sort of neutral ground, as well as half-way house in the matter of geographical distribution. It is the northernmost limit of the range of some; the southernmost limit of the range of others; and occasional breeding ground of many species. From unascertained, and we imagine unascertainable causes, there are many visiting species that remain or pass on, as it may happen. An ornithological note-book will for one year record probably a dozen species, of which no trace will be found during the following year, except during their passage north or south. In 1859, a cold storm overtook the Red-starts (*Setophaga ruticilla*) as well as many of the warblers. During the following month (June) there were more nests of warblers about Mercer county than the writer has found in the ten summers since.

Since 1865, we have seen no Pigeon-hawks between the dates of March 15th and October 15th. They may have escaped our notice, but we opine not. Next summer Mercer county may have a dozen nests of this species.

2. Red-bellied Woodpecker (*Centurus Carolinensis*). This Woodpecker makes its appearance in April very regularly, and reappears in equal or greater numbers in October, and some few have been met with during the winter. It seems strange that it does not breed within state limits, but it certainly does not, except in a few isolated instances; at least this is the conclusion the writer has arrived at, as in accordance with his own observations. Correspondents in the extreme northern and southern sections of the state have written me, however, that they have found both them and their nests in May. These letters were from Sussex and Cape May counties. As it undeniably breeds in Pennsyl-

vania and in New York, it is probable that the reason of the author's failure in finding their nests, except in one instance (vide *Geology of New Jersey*, p. 765), arose from the fact that the natural features of the sections of the state he happened in were not such as attract the species. It, however, *does not breed, as uniformly within state limits, as the five other species of Picidæ common to the state.*

The cutting off of the heavier growths of timber, and general alteration, and rendering of the country's surface tame by cultivation, must have the effect either of changing the habits of the birds, or of driving them from their former haunts. The latter is generally the case, and undoubtedly is so with reference to this species. The other *Picidæ* are still abundant except two species, *Melanerpes erythrocephalus* and *Hylatomus pileatus*. Throughout the winter the "Sapsucker" (*Picus villosus*), and Downy Woodpecker (*P. pubescens*), are very sociable, and appear as much at home in the maples along our town streets, as in the orchards beyond the village limits.

3. Traill's Flycatcher (*Empidonax Traillii*). The great influx of feathered life that comes to our state in the month of May is so varied as to species, and the many varieties having their particular haunts whereto they hie, that it is no easy matter, even after several attempts, to learn just what have come; and later in the season just how many have remained. That the list will vary year after year is unquestionable; but the species now under consideration is not one that simply remains during the summer occasionally. They do so now regularly, although their numbers vary very considerably. During the past seven summers the writer has regularly met with them. Previous to 1863 they are not mentioned in any of his note-books. They are, with us, a very restless, wild bird, remaining among the topmost branches of tall trees, and in such situations building their nests.

A nest of the Yellow-bellied Flycatcher (*E. flaviventris*),

was found at Princeton, New Jersey, during the past summer, containing young birds. This is the only nest of this species we have ever seen, but have met with the bird during the breeding season.

4. Wilson's Thrush (*Turdus fuscescens*). 5. Hermit Thrush (*Turdus Pallasii*). 6. Olive-backed Thrush (*Turdus Swainsonii*).

Early in May, with the Chat (*Icteria viridis*), and House-wren (*Troglodytes ædon*), and spring birds generally, there appear in our gardens in town hopping close along the fence, upon the ground, modest little Thrushes, that at once attract the attention of the most careless observers by their general similarity to the grand Song-thrush (*Turdus mustelinus*), only *abridged*. With the same jerking of the tail, and a very similar chirp, they industriously overturn the dead leaves fallen the autumn previous, and gather from beneath them innumerable spiders, insects, and small worms. Every half hour this search for food is disturbed by a quarrelsome Wren, that is generally driven off when the Thrush becomes fairly angered, when it will resume its hunt for food. They at this time constantly chirp—never sing. These small Thrushes are referable to one, or all, as the case may be, of the three species we have named above.

Wilson's Thrush (*Turdus fuscescens*) is the less numerous of the three species previous to June 1st, and from then until October, is the most so. It breeds within state limits in greater numbers than do the "Olive-backed" or "Hermit," but is more retiring in its habits at this time of the year, and appears to wander very seldom any great distance from its nest, during incubation, and to remain in the neighborhood of the nest until those of its fellows and the allied species have begun to reappear from the north, when again they frequent town gardens as well as more retired "country" localities. This species at this writing (November 24th, 1869), is now in Trenton, New Jersey.

The Hermit-thrush (*Turdus Pallasii*) is said by Audubon

to be quite abundant in New Jersey during the summer (vide *Birds of America*, Vol. III, p. 30), but I cannot endorse this statement altogether; but there may have taken place a change since he wrote in the movements of this bird, especially as he gives the northern mountainous portions of Pennsylvania as the southernmost limit of the breeding locality of the *Turdus fuscescens*, which is now common to New Jersey. The "Hermit," as the writer has met with it, is about as one to eight in the numbers that breed here, comparing it with *Turdus fuscescens*; and as one to twenty, compared with the whole number of *Turdus Pallasii* that arrive here in May. They disappear from general observation about June 1st, and as Audubon has written "throwing itself into the depths of the forests, there spends the summer months, frequenting the lowest and most shady thickets." During the latter part of the month of August last, the writer heard one of these birds singing, for the first and only time. The song excelled that of *Turdus mustelinus*. Its usual note is a shrill chirp, not as frequently repeated as that of *Turdus fuscescens* or *Swainsonii*. They were last seen in Trenton, New Jersey, on the 20th of November.

The Olive-backed Thrush (*Turdus Swainsonii*) which was formerly more abundant than of late years, makes its appearance in May, with the two preceding species, and resembles them in all its habits. It is unquestionably the least abundant of the three, either as a migratory or resident bird. During the summer of 1866 (vide *Geology of New Jersey*, p. 768) the three species of Thrushes were unusually abundant; and during the summer, many Olive-backed Thrushes remained and bred. During the past ten years they have remained as compared with those of their numbers that went North, about as one to fifty. Certainly the proportion remaining is not less.

The habits of these Thrushes suggest the probability that changes in the climate must be taking place in the northernmost limit of their range, and to preserve an equal extent of

territory as breeding grounds, must come South in proportion as they are compelled to relinquish territory at the North. At all events, there is a steadily increasing list of those migratory birds that formerly never remained in New Jersey during the summer, and that now do so, raising one or more broods during their sojourn. To this statement the writer would add another, that the number of "isolated instances" of migratory species remaining, is also increasing. How many such "isolated instances" must occur to make the breeding of the bird within state limits a fixed fact? One nest a year or a dozen? Is it probable that the young birds raised in an "isolated instance" recognize their birth-place the ensuing spring and so remain? Thereby we would have as the result of an accident, a permanent habit established among that particular species. Would we not?

7. Ruby-crowned Kinglet (*Regulus calendula*). 8. Golden-crested Wren (*Regulus satrapus*).

In the Kinglets, of all other birds, it would be supposed that we had those that were strictly, so far as New Jersey is concerned, a northern-breeding, Jersey winter-sojourning species; and, indeed, the great bulk of them are so, except that they go farther South, of course, as well as remain here. Nevertheless, they too, break in upon long established rules and the records of the books, and have both been found breeding in Sussex county, New Jersey. At least, we have as evidence of this their presence in June, and also that of their young in August. Of those that spent the winter and left in the spring of 1869, there remained probably one per cent. The impression I may have given of their numbers during the summer, in the Geology of New Jersey, p. 769, is erroneous, in so far as one might suppose that they were common at that season. They are rare, but diligent search will generally discover two or three in the course of the summer.

The Kinglets do not seem to be much affected by the severity of the winter; except that during severe snow-

storms they seek the sheltered woods. In the depths of winter they and the Winter-wren (*Troglodytes hyemalis*); the Creeper (*Certhia Americana*), and the Black-capped Titmouse (*Parus atricapillus*), enliven the woods, especially a wooded hillside with a southern exposure. Such a position is the most favorable by far, for finding these and other small winter resident birds. Unlike the Winter-wren (*T. hyemalis*), the Kinglets are not quarrelsome, but quietly from limb to limb, and tree to tree, flit incessantly, gathering the dormant insect life beneath the bark. To recur to the subject of their summer sojourn is it fair to suppose that those that do remain are old and too feeble to perform the journey north? If so, would they not also be too old for nidification and incubation? We think so; and so cannot account for the specimens in pin-feathers.

At this date (November 24th), both species of Kinglet are very abundant about the trees in the streets, and are remarkably tame.

9. The Worm-eating Warbler (*Helminthus vermivorus*).
10. Blue-winged Yellow-warbler (*Helminthophaga pinus*).
11. Golden-winged Warbler (*Helminthophaga chrysoptera*).
12. Yellow-rumped Warbler (*Dendroica coronata*).
13. Hooded Warbler (*Myiodiodes mitratus*).

We have now to take up the question of the geographical distribution of certain birds in a somewhat different manner, and to discuss, or rather to assert that we are not entitled to that usually or heretofore accredited to us. Of the five species of Warblers we have named above, four (except *Dendroica coronata*) have so far eluded us, although we have searched earnestly for them, after the spring visitors had gone. Coming as they did with them, and leaving simultaneously we supposed, like them, they, too, had gone north. This was our experience up to the time of completing our report for the "Geology of New Jersey." Three summers have since passed, and as yet we have found not even one specimen of the four species later than June 5th, and no

authentic nest. Of the many Warblers' nests we discovered there were four that we failed to identify, the birds belonging thereto not appearing when we had opportunities of watching. The general appearance of these nests which had eggs in was that of species common with us, although the eggs were a little peculiar. We have not had, since 1866, during any one summer, very good opportunities for hunting birds; but being ever on the lookout for the four species in question, we think it strange if they did remain throughout the breeding season without our detecting them.

As we have shown that some species that have heretofore always sought breeding grounds north of us now remain, therefore why should not others, formerly with us, conclude also to make a change, even though it be the opposite from that of their cousins? The surface of our state has materially changed in its general aspect within the past thirty years, since Audubon visited it; and these changes may have driven off certain species that probably are abundant no farther north or immaterially so, say Pennsylvania and New York. The changes we refer to are the very general cutting off of the woods, and clearing out of swamps. Certainly nine-tenths of the shelter that existed for birds in 1840 is now no longer in existence. The question may now be pertinently asked that if there is less shelter, why are there more new comers than there are departures of former residents? This we admit seems strange, and we can only answer it by asking another question; why should birds so similar as the *Sylvicolidæ* be of so many minds? Again, the four species in question are not at all sociable in their habits, and the new comers are; so we can see that the latter could be contented where the former would not, provided that the climate suited them.

The Yellow-rumped Warbler (*Dendroica coronata*), presents to us an instance of climatic geographical distribution which has not been published we believe; and that is, that from September to June this species has been met with in

New Jersey, on each of the intervening months. My attention was first drawn to it, by noting several in March, before any other species of the family had appeared. In February of the following year one specimen was seen and shot, and since then (1863), it has been met with sparsely in November, December, and January. These scattered Warblers are associated with the regular winter residents, Creepers, Nuthatches and Titmice.

14. Butcher Bird (*Collyrio borealis*). We have seen the Shrike as early as September quite abundant, but more generally it is in December and January that it is to be readily met with. No species visiting us from the North is more uncertain in its movements, and occasionally a winter passes without any being seen about. The snowy winters are those in which they are most numerous, and during such a winter their peculiarities are more readily studied, as they are during "open winters" far more shy and retired in their habits. With us they follow closely after loose companies of Snow-birds (*Junco hyemalis*), and seem to live very largely upon them. On the approach of warm weather they do not all go beyond the boundaries of the state, as the writer has seen them in Sussex county during the breeding season. But very few individuals do remain however.

15. Winter Wren (*Troglodytes hyemalis*). So like them in its appearance, and arriving in as large numbers so closely upon the disappearance of the *Troglodytes ædon*, there is a wide spread impression among persons with a smattering of disjointed ornithology, that they are one and the same bird, and that simply the former habit of migration has ceased. This absurd idea has gained ground in consequence of the very great accession to their numbers of the *T. hyemalis* that now annually appear. During the winter they are one of our most numerous species, ranking with *Passerella iliaca* and *Lophophanes bicolor* in this respect.

Like the "Shrike" (*Collyrio borealis*), they, too, do not depart wholly from us in the spring. Their numbers with

us in summer are much less than might be supposed, however, from my note in the "Geology of New Jersey," p. 776.

16. Red-bellied Nuthatch (*Sitta Canadensis*). A careful observer of the birds that now (November) are enlivening our generally leafless trees will not fail to notice continually a woodpecker-like moving little bird that has as unmusical a note as ever fell upon one's ear or added cacophonous variety to a harsh mixture, for verily the music of the woods hath now departed. Of the three birds to which these remarks are applicable, we refer particularly to that named above. A strictly northern species, early in November by ones and twos they make their appearance in company with *Sitta Carolinensis*, and to the casual observer they appear to be one and the same. In their habits, they, with us, present nothing distinctive. They number, we should judge, about one to twenty compared with "*Carolinensis*," and three or four per cent. remain during the summer. The locality of their nests and breeding habits are generally the same as in *S. Carolinensis*.

17. Black-throated Bunting (*Euspiza Americana*). Although abundant during the summer in Pennsylvania, less than one hundred miles from the state line (Delaware River), we had never, up to the end of the summer of 1867, been able to see these birds later than May, until they appeared in numbers in September. In the spring of 1868, and again during the past spring and summer, we found in various localities colonies of them breeding in low bushes, several nests being found in one field. We believe that for some reason we have not ascertained, they have annually left the state to breed and then reappeared. They are now with us (November) and we think that a few remain during the winter.

18. Rusty Black-bird (*Scolecophagus ferrugineus*). During the summers of '67, '68 and '69, these birds have been quite abundant about Trenton, New Jersey, associating with

the *Quiscalus versicolor* and *Agelaius phoeniceus*. They built their nests invariably in trees growing upon the banks of streams, raising one brood only.

19. Snipe (*Gallinago Wilsonii*). We find on conversing with intelligent observers throughout the state, that in the immediate neighborhood of all those tracts of meadows where the Snipe first appear in March, or even earlier, that quite a number remain during the summer and breed. This has been our opinion and coincides with the results of our observations about the extensive tract of meadow extending along the Delaware River from Trenton to Bordentown, New Jersey. During the past few years we think the number remaining has increased steadily. In the autumn many arrive from the North and remain a longer or shorter time according to the weather. Indeed, so long as the ground is not too much frozen to enable them to feed, they are abundant; and after the formation of thick ice some still remain, resorting to spring-holes, and such open water as gives them a chance to thrust their bills in the mud; but we cannot imagine what they then find to eat. During the winter we have examined the stomachs of many, but the mass contained therein was invariably so far digested as to render it impossible to recognize anything, except that it appeared to be largely animal matter.

20. Tell-tale Sandpiper (*Gambetta melanoleuca*). 21. Yellow-legged Sandpiper (*Gambetta flavipes*).

Early in May, following the course of the Delaware River, these birds in company with other *Scolopacidæ* arrive in the neighborhood of Trenton, New Jersey, and on the muddy shores and marshy inland of Duck Island, and the extensive sand bars and grassy islands near and above the city mentioned, make themselves at home. By the first of June the great majority have gone North; but with the few smaller species that remain, and the myriads of *Tringoides macularius*, the "Tell-tale" and "Yellow-legs" now reduced in numbers, associate, and when feeding along the river act

as guides, apparently, and certainly as guards. Being at this time of the year very shy, they give notice of the approach of danger, and leading the flock, "Tell-tales," "Yellow-legs," "Solitaries" and "Teeter," fly in large circles, at a great height, and then resume their feeding near where they were previously to being flushed. During the breeding season, if frequently disturbed while feeding, they fly to their nests.

Both the "Tell-tale" and "Yellow-legs" have been found breeding in Mercer county, New Jersey. They seek some quiet nook along a small stream, and in the high grasses build quite a substantial nest, raising one brood that leaves the nest before being able to fly. At this time they are a dull mouse color, and when approached, squat so closely to the ground and remain so motionless, that it is nearly impossible to detect them.

22. Solitary Sandpiper (*Rhyacophilus solitarius*). Although the numbers remaining in New Jersey during the summer vary very much, we have never failed to find them during June and July, and August brings them again plentifully from the North. They breed as regularly in the state as the *Spizella socialis*, if not as abundantly. While the number of isolated specimens we meet with is large enough to warrant the descriptive name *solitarius*, yet many are seen associated with the other Sandpipers, especially in May and early autumn.

23. Mallard (*Anas boschas*). 24. Green-winged Teal (*Nettion Carolinensis*). 25. Blue-winged Teal (*Querquedula discors*). 26. Buffle-headed Duck (*Bucephala albeola*).

There is generally in April or May a freshet in the Delaware River, and one that usually overflows the tract of meadow mentioned when speaking of the Snipe (*Gallinago Wilsonii*). During the prevalence of this high water the ducks usually make their appearance in large numbers, feeding over the meadows in loose flocks, the species being the Mallard (*Anas boschas*), Black-duck (*Anas obscura*), Sprig-tail (*Dafila acuta*), the two Teal (*Nettion Carolinensis* and

Querquedula discors), Shoveller (*Spatula clypeata*), Widgeon (*Mareca Americana*), Wood Duck (*Aix sponsa*), Whistler (*Bucephala Americana*), and Buffle-head (*Bucephala albeola*).

After the waters have subsided they generally congregate at the river, and after a week or more, during which time many are killed, they have left. But not wholly so, as during the summer months, besides the beautiful *Aix sponsa*, which we always have, there are quite a number of *Anas obscura* always to be met with, and not unfrequently the four species we have mentioned above. Of the four species the Mallard is the most abundant, and the "Buffle-head" least. That they all breed in the state there can be no question.

We conclude with the above, the selections from our notes, made in the field and at various times, on the peculiarities, if we may call them such, in the ornithology of New Jersey, with the thoughts they have suggested, believing they will be of interest to those especially giving attention to the subject of geographical distribution. Of the three hundred species of birds included in the ornithic fauna of New Jersey, of course there are many that are exceedingly rare in our territory. Among some species there have happened freaks of habit, unique instances so far as our experience goes, that though entertaining, are doubtfully of sufficient value to warrant their publication; but as apparently trivial occurrences have sometimes proved a help in the solution of difficult questions, we propose to give a plain narration of one or more such occurrences.

In January, 1869, an acquaintance in hunting over the Delaware (Trenton) meadows for hawks came to a lively spring in a hillside having a southern exposure. As he was about leaving it he flushed from grass still green and long, a pair of Virginia Rails (*Rallus Virginianus*), and fortunately killed them. They were both *fat*, showed no signs of having been previously wounded and thereby detained, and

flew as rapidly and with as much apparent vigor as in September. Farther search failed to discover others at the time. Two weeks later *three others were killed*, and in the first week of February, *one more*. These latter specimens were equally fat and vigorous. No similar circumstance has come under our notice.

Similar instances of the presence of the Night Heron (*Nyctiardea Gardenii*) have three times come under our notice. We have found these birds sitting on trees near springs, from whence the water flowed swiftly, and about which the grass remained quite fresh. Leaving them undisturbed, but watching them frequently, they were never seen to leave their perch. From the accumulation of droppings it was evident that the particular branch even, on which they were first seen, was that on which they had been resting for some time past. Only single specimens have been thus found, all male birds, and they have always been much emaciated. When forced to move they all proved able to fly, but returned to their accustomed place, after a circuitous flight of short duration. Were they too old to go South? Did they get any food? If so, what and where? On dissection the stomachs of these three specimens proved to be empty, but the *uppermost droppings were fresh!*

THE FORMER EXISTENCE OF LOCAL GLACIERS IN THE WHITE MOUNTAINS.*

BY PROFESSOR L. AGASSIZ.

TWENTY-THREE years ago, when I first visited the White Mountains, in the summer of 1847, I noticed unmistakable evidences of the former existence of local glaciers. They

* Read, in the absence of Professor Agassiz, by J. B. Perry, before the American Association for the Advancement of Science, Troy meeting, Aug., 1870.